

REMARKS

This application has been reviewed in light of the Office Action dated June 4, 2003. Claims 1, 2, 7-15 and 18-49 are now presented for examination. Claims 3-6, 16 and 17 have been cancelled, without prejudice or disclaimer of the subject matter presented therein. Claims 21-49 have been added to provide Applicants with a more complete scope of protection. Claims 1, 7, 11, 21-23, 28, 32-39, 43 and 48 are in independent form.

The Examiner is sincerely thanked for the indication that Claims 1, 2, 7-15 and 18-20 are allowed.

Claims 3-6 and 17 were been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,072,251 (Markle) in view of U.S. Patent No. 4,607,167 (Petric). In addition, Claim 16 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Markle in view of Petric and further in view of Japanese Utility Model Publication 6-44093 (Numaga).

Without conceding the propriety of these rejections, Claims 3-6, 16 and 17 have been canceled, thereby rendering the rejections moot.

Applicants now submit the following comments regarding the added claims.

Added Claims 21, 23-27, 32, 34, 37 and 40 each recite, in part, a magnetic field shield surrounding a non-facing magnet surface that is a surface other than a facing magnet surface facing an electromagnetic coil, and which moves together with the magnet relative to the electromagnetic coil.

Arranging the magnetic field shield so as to move together with the magnet contributes to reducing the size dimensions of the magnetic field shield because the magnetic field shield is not required to have a size covering an entire moving range of the magnet (see e.g., the "Fifth Embodiment" described in the specification).

Markle shows, in Figure 16, a first magnetic shield 822 and a second magnetic shield 824. However, in Applicants' view, the first magnetic shield 822 must be fixed to a stationary member such as a platen 610 or a beam projection system since a small opening of the first magnetic shield 822 is designed to allow a beam 820 passing through the opening toward a wafer 602. If, hypothetically, the first magnetic shield 822 were to be moved together with stage 600, the beam 820 seemingly could not pass through the opening of the first magnetic shield 822. With respect to the second magnetic shield 824, Markle teaches that the second magnetic shield 824 can be sandwiched between an upper portion 600' and a lower portion 600'' of the stage 600. However, the second magnetic shield 824 is seen to have a planar shape and is not seen to be arranged to surround left and right side surfaces (i.e., non-facing surfaces) of any magnet arrays 798 which do not face the coils. In addition, the second shield 824 extends outwardly and away a sufficient distance from outer side surfaces of the stage 600 (see, e.g., from column 15, line 65 to column 16, line 5). Thus, according to Applicants' understanding, the second shield 824 is not designed to have reduced dimensions, even if, *assuming arguendo*, it were to be moved together with the magnet arrays 798.

Petric discloses an internal conical surface member 24' that is fabricated from a ferromagnetic material in order to shield a working beam. However, the conical surface member 24' is attached to an electron beam column 10. Therefore, according to Applicants' understanding, the member 24' is not seen to be designed to move together with a magnet.

Numaga discloses, in Figures 1 and 2, a magnetic filed shielding cover 19 surrounding a moving element 13 made of a magnetic material. However, in Applicants' view, the shielding cover 19 is fixed to a vacuum chamber 1, and therefore cannot move together with the moving element 13.

Indeed, nothing has been found, or pointed out, in either Markle, Petric or Numaga, that would teach or suggest a magnetic field shield that is arranged to surround a non-facing magnet surface that is a surface other than a facing magnet surface facing an electromagnetic coil, and which moves together with the magnet relative to an electromagnetic coil, as recited in Claims 21, 23-27, 32, 34, 37 and 40. Accordingly, those claims are believed to be patentable over Markle, Petric and Numaga.

Claims 22, 28-31, 33, 35, 38 and 41 each recite a common feature that a first side of a first magnet facing an electromagnetic coil and a second side of a second magnet facing the electromagnetic coil, are directed to directions different from each other, and a magnetic field shield is arranged to surround sides of the first and second magnets which are opposite sides of the first and second sides. The latter feature is supported in the specification as originally filed, at least by the magnetic field shield having a three-

dimensional shape shown in, e.g., Figures 19 and 20 of the present application. Also, according to Claims 22, 28-31, 33, 35, 38 and 41, the shield moves together with the first and second magnets.

Markle in Figure 16 shows magnet arrays 798, a first magnetic shield 822 and a second magnetic shield 824. Although the magnet arrays 798 include plural magnets each facing coils, the facing surfaces of the plural magnets are all directed to the same direction, i.e., a lower direction. Also, both the shields 822 and 824 of Markle have a planar shape, i.e., a two-dimensional shape rather than a three dimensional shape. In Applicants view, Markle is not seen to teach or suggest the above-described features of Claims 22, 28-31, 33, 35, 38 and 41.

Moreover, as pointed out above, neither Petric nor Numaga is seen to disclose or suggest a shield that moves together with magnets, and therefore each of those references also is not seen to teach or suggest the above-described features of Claims 22, 28-31, 33, 35, 38 and 41.

Claims 36, 39 and 42 each recite a common feature that a first magnetic shield arranged to surround a first non-facing magnet surface moves together with a first magnet substantially parallel to a first direction, and a second magnetic shield arranged to surround a second non-facing surface moves together with a second magnet substantially parallel to a second direction.

With regard to Markle, that patent is seen to disclose, in Figure 16, magnet arrays 798 arranged beneath the stage 600, a first magnetic shield 822 arranged above the

stage 600, and a second magnetic shield 824 extending through and away from the stage 600. The stage 600 moves in X, Y and Z directions. As described above, the first magnetic shield 822 does not move together with the magnet arrays 798. The only magnetic shield that moves together with the magnet arrays 798 is the second magnetic shield 824. Accordingly, Markle is not seen to teach or suggest two magnetic shields moving substantially parallel to first and second directions, respectively, together with corresponding magnets, as recited in Claims 36, 39 and 42.

As described, neither Petric nor Numaga is seen to disclose or suggest magnetic shields that move together with magnets in a manner as recited in Claims 36, 39 and 42.

Accordingly, Claims 36, 39 and 42 are each believed patentable over Markle, Petric and Numaga.

Claims 43-49 each recite that a first magnetic field shield is disposed between a driver and a sample, and a second magnetic field shield is disposed between the first magnetic field shield and the sample.

As pointed out above, Markle discloses in Figure 16 a first magnetic shield 822 and a second magnetic shield 824. However, although the second magnetic shield 824 is disposed between a wafer 602 and a driver comprised of magnet arrays 798 and coils 500, 502, 812, 814, 816 and 818, the first magnetic shield 822 is not seen to be disposed between the wafer 602 and the driver. That is, the first magnetic shield 822 is disposed between the wafer 602 and the beam source that generates a beam 820.

Petric discloses an internal conical surface member 24' that is fabricated from a ferromagnetic material in order to shield a working beam. However, Petric is not seen to teach or suggest any shields disposed between a wafer 28 and linear motors (which would correspond to drivers) arranged in a stage assembly 30.

The teachings of Numaga were described above.

Applicants respectfully submit that nothing in either Markle, Petric or Numaga, is seen to teach or suggest a first magnetic field shield disposed between a driver and a sample, and a second magnetic field shield disposed between the first magnetic field shield and the sample, as recited in Claims 43-49.

Accordingly, Claims 43-49 are each believed patentable over Markle, Petric and Numaga.

A review of the other art of record has failed to reveal anything which, in Applicants' opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. Those claims are therefore believed patentable over the art of record.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

Applicants' undersigned attorney may be reached in our New York office by

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Respectfully submitted,



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